CHAPTER THREE

CONCLUSIONS AND RECOMMENDATIONS

The impact of weather on aviation operations cannot be overstated. Not a day goes by without weather affecting the safe and efficient operation of aircraft within the National Airspace System. Air traffic delays and aircraft accidents are often attributed to weather. One way to mitigate the adverse impacts of weather is to invest in technology that will allow us to better observe and forecast the weather events that present the greatest hazards to aircraft. Another way to mitigate the adverse impacts is to ensure that the providers and users of aviation weather information are adequately trained. For pilots, an understanding of weather and its impacts on their aircraft is critical. Likewise, for providers of aviation weather information, an understanding of weather's impact on aircraft operations will allow them to better provide the support needed by decision-makers. In addition to a basic knowledge and understanding of how weather affects aviation operations, training is required for both providers and users as technological developments introduce new capabilities to observe, process, and display weather information. This training will allow the capabilities of new technology to be realized and will assist the transition of research and development to operations.

Given the importance of training in the transition of new capabilities to operations, the intent of this report has been to examine in greater detail the training component associated with the programs in the Tier 3/4 Baseline Report. The Baseline Report included some information on training but the current focus is squarely on training itself. The specific areas of interest are (1) the Tier 2 training initiatives, (2) Tier 3/4 training, (3) the tailoring of training for users and providers, (4) training leveraging, and (5) potential training shortfalls.

CONCLUSIONS:

Based on analysis of information provided by agencies and organizations, the following conclusions are presented:

(1) Two of the five Tier 2 training initiatives had no work identified in the April 2001 Baseline Report. However, information gathered during this effort has identified training associated with other Tier 3/4 programs that with some modification could provide support to all Tier 2 training initiatives.

(2) Approximately eighty percent of the Tier 3/4 programs identified in the April 2001 Baseline Report reported that training has either been implemented or is under development. The majority of the remaining programs are early in the development cycle and training milestones have not yet been established.

(3) The designers of training for the various Tier 3/4 programs appear to be addressing the needs of designated user and provider trainees. This is implied from the various training levels, training methods, and delivery resources identified by the

program managers. Additionally, the length of training, the group sizes, and the trainer to trainee ratios appear to fit the needs of the trainees.

(4) There appear to be opportunities for leveraging training resources among the various organizations involved in developing programs to improve aviation weather services. Although some tailoring for specific applications might be required, the resources required would likely be less than those required to start from the beginning. An example is the Icing Video developed by NASA's Education and Training Element. Although geared to regional airlines, the video could also be useful to other users with some modification.

(5) The potential for training shortfalls exists with some of the Tier 3/4 programs. This is especially true for those programs that are developing enabling technologies for which there is currently no clear path to operations. In these cases the developer is not addressing operational training; the agency that transitions the technology to operations should include training.

(6) The FAA's Aviation Weather Technology Transfer (AWTT) Board is the approval authority for FAA-sponsored products transitioning to operations. This process is proving effective in ensuring that all aspects of product integration, including training, have been considered before a new product is fielded.

(7) This study has concentrated on training associated with those programs identified in the Tier 3/4 Baseline Report. We have since become aware of other training initiatives that appear to meet training needs of providers and users of aviation weather information. The Cooperative Program for Operational Meteorology, Education and Training (COMET) has several training initiatives primarily for providers that address forecasting of aviation weather hazards. Also, the National Weather Association's Aviation Committee has developed two internet-based courses for pilots entitled, "Winter Weather and Flying", and "Thunderstorms and Flying". There are undoubtedly other training activities, not included in this report, that should be reviewed in order to gain a more complete picture of how training needs of the aviation community can be met.

RECOMMENDATIONS/NEXT STEPS:

(1) Using the FAA's AWTT process as a model, interagency coordination with respect to the transition of research and development to operations should be expanded. To help increase interagency coordination and collaboration, especially as we realize the benefits of new technology transitioning to operations, the OFCM is reactivating the Committee for Aviation Services and Research. The committee will focus on those areas dealt with during the Aviation Weather User Forum; namely product development and dissemination, training, cockpit displays, and decision support systems.

(2) Those organizations with expertise in training, such as the National Weather Service for forecasters and National Aeronautics and Space Administration for pilots (icing), are encouraged to take a leadership (lead agency) role in promoting the consolidation of aviation weather training that is common to multiple agencies.

(3) Training managers should identify and resolve apparent training deficiencies. For example, our analysis shows that for Tier 3/4 programs with implemented training, relatively few report they measure the trainee's successful retention of the training objective or that they document when training is completed.

(4) Agencies should review training under their purview to ensure there are no gaps in training for functional areas and for skill levels within functional areas. For example, our analysis shows that relatively few ground operations personnel and flight standards personnel are designated for training on Tier 3/4 programs.

(5) The training templates from this study should be maintained as a resource for the aviation community and updated periodically. Additionally, new program initiatives, as well as training activities being conducted or sponsored by industry partners, should be included in future updates.